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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,625	11/21/2003	Kei Matsuoka	245719US2RD	8609
22850 7590 11/02/2007 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER RHEE, JANE J	
			ART UNIT 1795	PAPER NUMBER
			NOTIFICATION DATE 11/02/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/717,625	MATSUOKA ET AL.	
	Examiner	Art Unit	
	Jane Rhee	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5,7-13,15-21 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5,7-13,15-21,23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Rejections Withdrawn

1. The 35 U.S.C. 102(b) rejection of claims 1,5,7-9,15-17,23 anticipated by Surampudia et al. has been withdrawn due to applicant's arguments filed on 8/24/2007.
2. The 35 U.S.C. 103(a) rejection of claims 11-13,19-21 over Surampudi et al. in view of Von Andrian has been withdrawn due to applicant's arguments filed on 8/24/2007.
3. The 35 U.S.C. 103(a) rejection of claims 10 and 18 over Surampudi et al. in view of Tsuki et al. has been withdrawn due to applicant's arguments filed on 8/24/2007.

New Rejections

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1,5,7-9,11, 15-17,23 are rejected under 35 U.S.C. 102(b) as being anticipated by Beshty et al. (4670359).

As to claim 1, Beshty et al. discloses a fuel cell system comprising a liquid fuel cell having an anode (figure 2 number 32), a cathode (figure 2 number 37), and an electrolyte membrane put therebetween, a fuel supply unit supplying liquid fuel to the anode (figure 2 number 80) an air supply unit supplying air to the cathode (figure 2 number 34), and a heat exchanger (figure 2 number 31) exchanging heat between the

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liquid fuel supplied by the fuel supply unit to the anode (figure 2 number 80) and an exhaust exhausted from the liquid fuel cell (figure 2 number 54,57). As to claim 5, Beshty et al. discloses that the fuel supply unit further comprises a mixing container mixing the fuel and the exhaust so as to form a mixture in advance (figure 2 number 75). As to claim 7, Beshty et al. discloses that liquid fuel cell is a direct methanol fuel cell (figure 2 number 80).

As to claim 8, Beshty et al. discloses a fuel cell system comprising a liquid fuel cell having an anode (figure 2 number 32), a cathode (figure 2 number 37) and an electrolyte membrane put therebetween, a fuel supply unit including a mixing container mixing liquid fuel (figure 2 number 75) and an exhaust exhausted from the liquid fuel cell so as to form a liquid mixture (figure 2 number 38), the liquid mixture being supplied to the anode (figure 2 number 58), an air supply unit supplying air to the cathode (figure 2 number 34), a heat exchanger connected to the mixing container so as to exchange heat between the ambient air and the liquid mixture in the mixing container (figure 2 number 26). As to claim 9, Beshty et al. discloses that the mixing container is configured so that the exhaust passes through the mixture housed in the mixing container thereby gas fractions in the exhaust is separated (figure 2 number 38 and 75). As to claim 11, Beshty et al. discloses a second heat exchanger exchanging heat between the liquid mixture supplied by the fuel supply unit and an exhaust exhausted from the anode (figure 2 number 31). As to claim 15, Beshty et al. discloses wherein the liquid fuel cell is a direct methanol fuel cell (col. 1 lines 7-9).

As to claim 16, Beshty et al. discloses a fuel cell system comprising a liquid fuel cell having an anode (figure 2 number 32), a cathode (figure 2 number 37) and an electrolyte membrane put therebetween, a fuel supply unit (figure 2 number 80) including a mixing container mixing liquid fuel and an exhaust exhausted from the liquid fuel cell so as to form liquid mixture (figure 2 number 75), the liquid mixture being supplied to the anode (figure 2 number 31A), an air supply unit supplying air to the cathode (figure 2 number 34), a heat exchanger exposed to an ambient air (figure 2 number 26 and 48) and a circulation unit circulating the liquid mixture between the mixing container and the heat exchanger so as to exchange heat between the ambient air and the liquid mixture in the mixing container (figure 2 number 75). As to claim 17, Beshty et al. discloses that the mixing container is configured so that the exhaust passes through the mixture housed in the mixing container thereby gas fractions in the exhaust is separated (figure 2 number 38 and 75). As to claim 19, Beshty et al. discloses a second heat exchanger exchanging heat between the liquid mixture supplied by the fuel supply unit and an exhaust exhausted from the anode (figure 2 number 31). As to claim 23, Beshty et al. discloses that fuel cell is a direct methanol fuel cell (col. 1 lines 7-9).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 12-13, 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beshty et al. in view of Von Andrian (6977118).

Beshty et al. discloses the fuel cell system described above. As to claims 12 and 20, Beshty et al. fail to disclose a second heat exchanger exchanging heat between the mixture supplied by the fuel supply unit and an exhaust exhausted from the cathode. As to claims 13 and 21, Beshty et al. fail to disclose a second heat exchanger exchanging heat between the mixture supplied by the fuel supply unit and an exhaust exhausted from the cathode and anode.

Von Andrian teaches a plurality of heat exchangers (figure 1 numbers WT1, WT2, and WT3) exchanging heat between the fuel supplied by the fuel supply unit (figure 1 methanol tank) to the anode (figure 1) and an exhaust exhausted from the liquid fuel cell wherein the exhaust is exhausted from both the anode and the cathode (figure 1) for the purpose of preheating the fuel mixture in the first heat exchanger and then heating the fuel mixture to operating temperature through the second heat exchanger (col. 3 lines 35-45).

Therefore, it would have been obvious to one having ordinary skill in the art at the time applicant's invention was made to provide Beshty et al. with a plurality of heat exchangers exchanging heat between the fuel supplied by the fuel supply unit to the anode and an exhaust exhausted from the liquid fuel cell wherein the exhaust is exhausted from both the anode and the cathode in order preheat the fuel mixture in the first heat exchanger and then heat the fuel mixture to operating temperature through the second heat exchanger (col. 3 lines 35-45) as taught by Von Andrian.

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6. Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beshty et al. in view of Tsuki et al. (4629664).

Beshty et al. discloses the fuel cell described above. Beshty et al. fail to disclose a second mixing container communicated with the mixing container wherein the liquid mixture is supplied from the second mixing container to the anode.

Tsuki et al. teaches a second mixing container communicated with the mixing container wherein the liquid mixture is supplied from the second mixing container to the anode for the purpose of providing good fuel cell performance (col. 8 lines 31).

Therefore, it would have been obvious to one having ordinary skill in the art at the time applicant's invention was made to provide Beshty et al. with a second mixing container communicated with the mixing container wherein the liquid mixture is supplied from the second mixing container to the anode in order to provide good fuel cell performance (col. 8 lines 31).

Response to Arguments

7. Applicant's arguments with respect to claims 1,5,7-13,15-21,23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jane Rhee whose telephone number is 571-272-1499. The examiner can normally be reached on M-F 9-6.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Jane Rhee', with a stylized, cursive script.

Jane Rhee
October 17, 2007